Grease to the wheel or a spanner in the works?
An investigation of office and industrial occupier displacement and property market filtering in Tyne and Wear using the chaining technique

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Keywords: chaining; displacement; filtering; local property market; property-led regeneration; Tyne and Wear

Synopsis

The research uses a chaining technique to study the scale and impact of the displacement of office and industrial occupiers in the Tyne and Wear conurbation. The status and origin of occupiers of twenty office and industrial developments, promoted or assisted by the public sector, have been recorded to determine the distance that they have moved and the number of net new jobs generated. Property chaining reveals the extent to which the filtering effect has resulted in re-occupation of buildings and permits the quantification of the amount of property remaining vacant and its location.

Analysis of the recorded chains has revealed that more than half of all occupiers on assisted schemes have relocated within Tyne and Wear area and one in three occupier chains generated by such relocations result in vacant property elsewhere within the metropolitan area. The displacement of employment and economic activity within the conurbation can be mapped and used to inform the action of public agencies to help reduce or ameliorate the negative side-effects of their intervention. The chaining technique proves an elegantly simple and robust technique by which to determine the scale and distribution of occupier displacement in property markets.

Property-led Urban Regeneration

Turok (1992), suggests that there is a strong role for property-led regeneration in areas where:

i) there are extensive problems with land conditions, the fabric of buildings
ii) constraints to redevelopment are physical, institutional and economic
iii) shortages of land and floorspace restrict inward investment and indigenous growth
iv) the response of the private sector is either insufficient or inappropriate to occupiers' need

The Urban Task Force (1999) suggested that 15% of total property investment each year could be classified property-led regeneration, however precisely how property development is intended to bring about the economic revival of urban areas has not been officially articulated and the links between property and economic regeneration are still poorly understood. There is a lack of clarity about the ultimate objectives of urban policy and the means by which they are to be achieved and evaluations need to provide assessment of how relevant markets are working and how they are affected by intervention (HM Treasury 1995). Tyler (2001) recognises that there is a need to help correct the adverse impact of market forces on deprived urban areas and this forms part of the rationale for area based regeneration programmes, particularly in stimulating urban land and property markets.

Turok (1992) also speculates that the provision of property will lead to local transfers of existing firms or will accommodate firms that would have moved into a region anyway. Ball et al (1998) confirm that the majority of companies that relocated into E.Z.'s were displacement moves, and suggest that intervention has led to micro changes in locational advantage without necessarily changing the quantum demand for space.

The DoE's own research (1995a) raised the concern that the stimulation of a viable property market on EZ's has been at the expense of the local property market off-zone. The same document claims that evidence from off-zone property markets suggests that voids were not caused by competing developments on the zones, rather that a filtering process was occurring and that vacant premises persisted because they were unsuitable to the needs of modern businesses (DoE 1995a). The extent to which vacated properties are taken up by the filtering process and the spatial distribution of persistently vacant properties will be investigated by this study.

The research is not an assessment of policy performance, traditionally quantified by crude outputs, but rather an investigation of the impact of policies on the office and industrial sectors of the Tyne and Wear property market. As Robson (1994) noted, spatially targeted policy instruments have distorted markets and spatial opportunities for investment; the aim and the result in essence is (sic) to influence the location of economic development (DoE 1994). The study of occupier chains, generated by property developments, permits investigation of their impact on other localities to determine whether one area's gain has been at another's expense.

Research Aims and Objectives

The aim of the research is to understand the influence that property-led regeneration policies have had on the location, provision and occupation of real property in Tyne and Wear.

The objectives of the research are:

- To investigate the frequency, scale and range of displacement generated by property-led regeneration projects
- To assess the degree to which vacated properties have been re-occupied through the filtering process
- To determine whether the of supply of new office and industrial property has resulted in vacancy
- To quantify the number of jobs located on new developments and reveal how many of these have been displaced from elsewhere in the conurbation

The Tyne and Wear Conurbation

Tyne and Wear, recognised as the regional capital of the North East of England, with a population or around one million, has a fairly remote location. The nearest urban area is Teesside, 40 miles to the south, and its main competitors for office and industrial occupiers are Edinburgh and Leeds, 107 miles and 93 miles away respectively. Over the past 25 years the North East's economy has been transformed, with job losses in primary and manufacturing industries offset by new jobs in the service sector. Mobile international investment has led to a diversification of the economic base, with growth in the automotive, electronic, advanced engineering and pharmaceutical sectors (ONE NorthEast 1998).

Over the last thirty years Tyne and Wear has been a testing ground for a diverse range of public policies aimed at ameliorating the impacts of industrial decline the problems posed by urban deprivation (Robinson1994). There have been three separate designations of E.Z.'s in Tyneside (1981-1991), Sunderland (1990-2000) and Tyne Riverside (1996-2006), an urban development corporation (TWDC) whose urban development area was the banks of the Rivers Tyne and Wear and three City Challenges (Newcastle West End, North Tyneside and North Sunderland). In addition, English Estates and English Partnerships have been active in Tyne and Wear, from their head quarters on the Team Valley Trading Estate, since 1960. As a result, over the past two decades there has been little new development in the office and industrial sectors that has not benefited from some form of public sector assistance, be this EZ, UDC, City Challenge, English

Partnerships, ERDF, SRB Challenge Fund, or in many cases a combination of two or more of these (Robinson 1994).

The conurbation has a distinct urban boundary, being almost completely surrounded by a green belt, permitting a clear delineation of the urban area, which is essential in determining whether an occupier is new to the conurbation. Pratt (1994) suggests that another good reason for choosing a peripheral region exhibiting market failure is because there is value in the exploration of the margins, in a social and spatial sense, as it often lays bare dynamics and revealing processes not always observable in less peripheral areas.

Definition of the 'local' area, within which to confine the study, is a more taxing problem (see the debate between Duncan & Savage and Cooke in Antipode 21:3, 1989). Erickson and Syms (1989) argued that the negative effects of the EZ's could extend for ten or even twenty miles. However for their study of EZ's they chose to limit the spatial extent of the market to a few miles, generally a range of one to three miles around the zone. The DoE (1995b), by contrast, used a 10 mile radius to define the local area for the evaluation of Enterprise Zones. The Tyne and Wear conurbation, with a maximum radius of 10.3 miles (16.6 km), conforms to the DoE's adopted protocol and has been adopted as the appropriate area within which to limit the study. The findings of the research suggest that the influence of developments can extend beyond the boundaries of the conurbation generating relocations from neighbouring counties and other urban areas.

Parameters of study

The research is confined to the office and industrial sectors of the property market because both have witnessed significant property-led regeneration activity over the last 20 years. Office and industrial development is seen by successive Governments as a mechanism for increasing economic activity and generating employment and it is in these sectors that the problems of displacement and relocation are most apparent.

There is a strong rationale for studying both the office and industrial markets because it is often difficult to distinguish the two, particularly within the B1 (Business Use Class) where buildings can move between office, research and light industrial use. For example, industrial premises usually contain an office element, some call centre buildings are often little more than well equipped sheds and it is sometimes difficult to determine whether research and development is an industrial or office based activity. The general influence affecting the location of offices are similar to those of manufacturing industry (Ball et al 1998).

The retail sector has not been studies because it is a complex property and occupier market that is more influenced by national trends and operators, and as a result has received far less attention from regeneration agencies. With the exception of the Metro Centre in Gateshead, there has been relatively little retail development in Tyne and Wear, promotes by regeneration agencies, because of concerns about how such schemes would impact on existing retail locations.

The research focuses on office and industrial developments that have been assisted by fiscal or grant regimes, or promoted by regeneration agencies, since 1980 (see Appendix A). From the early 1980's there was a conscious attempt on the part of central government to bolster local economies and local areas through private sector-led property development (Robinson & Shaw 1994). This was heralded by the 1980 Local Government Planning and Land Act which gave the Secretary of State for the Environment the power to designate EZ's and UDC's, the legacy of which still persists over 20 years later.

Twenty property developments, constituting the most significant examples of post 1980 property-led regeneration in the industrial and office sectors in Tyne and Wear, were selected for the research. They range from office schemes on brownfield sites, to industrial development on greenfield sites and business starter units in town centres. The developments comprise over 500 buildings totalling in excess of 500,000 sq.m. (5,500,000 sq.ft.) of accommodation on nearly 500 hectares (1200a) of land. The developments are occupied by firms employing over 25,000 people, and the total investment in buildings, plant and machinery exceeds £2bn. A profile of the 20 developments is shown in Appendix B.

Primary Research and temporal issues

Site inspections of the twenty developments, following an initial desk top survey, identified around 800 individual office and industrial occupiers from which a database was compiled. Each occupier on the database received a postal questionnaire to identify their status, the origin of the firm and reasons for moving. In addition, information on the number of employees before and after any move, the costs of occupation and any financial incentives secured by relocating were sought. A response rate of just less than 25% was achieved which allowed detailed data to be compiled on 175 occupiers representing all 20 developments.

The initial survey work was completed in 1998 and since this date the occupier database has been updated as buildings have come on stream and new occupiers have moved in. There has

inevitably been some turnover of the original occupiers since the survey was completed however, for the majority of the developments, turnover has been low because most firms (79%) moving to new premises intend to remain for at least five years. Indeed over half of the survey population confirmed that they intended to stay in their premises for more than 10 years and only one in five occupiers suggested that they were likely to stay less than 5 years. The majority of the data gathered by the initial survey work therefore has a shelf life of at least five years.

The survey also revealed that 75% of the office and industrial occupiers are tenants with leases, 10% own their own premises, predominantly on E.Z.'s due to the availability of capital allowances, and 15% are licencees. The latter are almost exclusively occupiers of developments providing starter or nursery units, which are usually prone to a higher turnover of occupiers because of the easy-in easy-out terms that they offer. The replacement of one tenant by another is not in itself significant because the decision by the original occupier to move to a particular development is still valid and subsequent moves simply add to the size of the survey and allow more chains to be investigated.

Of more temporal significance is the identification of chain ends, which are far more likely to change in the short term. The chaining was carried out between spring and summer 2001 and it is to be expected that the status of some properties may have altered since the survey was completed. For example, chain end properties that were recorded as being vacant or awaiting redevelopment may have been reoccupied and properties that were recorded as being occupied may have become vacant. It is not unrealistic to suggest that there will be some balancing out between these changes that are inevitably going to occur and the scale of the survey means that the results are sufficiently robust to withstand minor variations. Updating of chain ends at a later date would be possible to determine the extent of any changes in status.

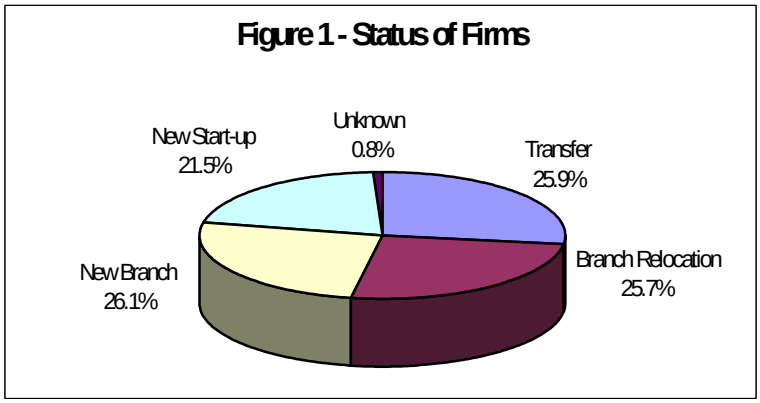
Three categories of occupier status were adopted from the Final Evaluation of EZ's (DoE 1995a) in order to classify firms. These are '*new branches'*, '*new start-ups*' and '*transfers*'. To refine the categorisation of occupier status, a fourth category of '*branch relocation*' was adopted to distinguish between branches that have derived from within the conurbation as opposed to those relocating from outside. The '*pre-designation firm'* category has not been used because there are no pre-existing firms in the survey as all the premises covered by the study are new.

In order to complete a comprehensive chaining exercise it was necessary to carry out a total population telephone survey to determine the status and origin of every occupier on all bar one of

the developments, the exception being Team Valley Trading Estate, which was sampled because of its size. Analysis of the telephone survey, confirming the preliminary questionnaire survey results, indicated that the majority of office and industrial occupiers on the new developments originate from within the local area. Transfers and branch relocations account for over half of all establishments (see Table 1). Valente and Leigh (1982), in their modest chaining of industrial occupiers in London, determined that relocations take place most often as a result of a need to expand. This was confirmed by the survey where 55% of firms relocated to facilitate expansion, 17% to facilitate rationalisation or contraction and the remaining 28% relocated for other reasons.

Table 1 – Status of firms

Status	Number	Percentage
Transfer	132	25.9%
Branch relocation	131	25.7%
New Branch	133	26.1%
New start-up	110	21.5%
Unknown	4	0.8%
Total	510	100%



The most important reasons for choosing a destination are better location, improved quality of accommodation, availability of workforce and value for money. Of secondary importance were security, improved environment and public sector assistance. Least influential were factors such as facilitie, transport and car parking (Greenhalgh et al 2000).

Employment generation and displacement

Data was collected on the number of employees working at premises on the twenty developments and relocating firms were asked how many people they employed at their old premises. Although

not all employees will have stayed with firms when they relocated, the employment data does allow a crude estimation of the net number of new jobs created by firm expansion when they move to new premises. Of the 510 firms surveyed, 32 were unable to provide data and 60 recorded no change in the number of employees. Of the remaining firms, only 27 had fewer employees after the move but the significant majority (75%) had increased their workforce either on moving or after having moved. It should be noted that there is an important distinction between relocation to facilitate expansion and relocation to improve efficiency, which may involve rationalisation (Fothergill, Monk & Perry 1987). From the data collected it appears that few firms are relocating in order to facilitate the latter.

Table 2 – Employment change by firm

Employee data	Number of firms	% number
Increase	390	76.5%
No change	62	12.2%
Decrease	27	5.3%
No data	31	6.0%
Total	510	100%

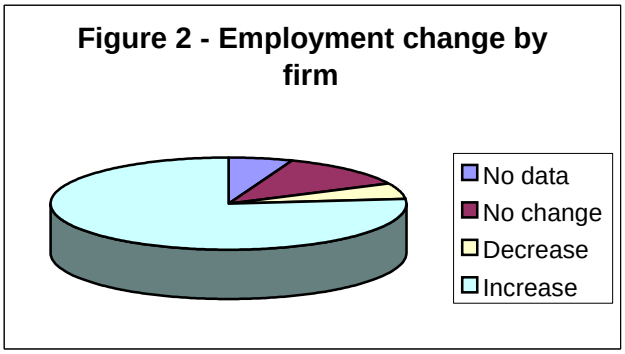
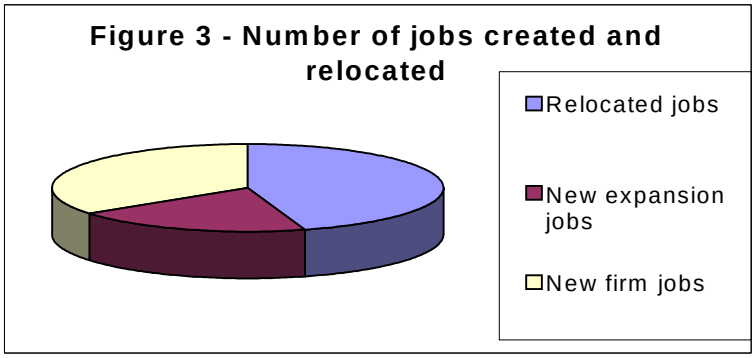


Table 3 – Number of jobs created and relocated

Status of firm	No. jobs	% of total jobs	% of new jobs
New expansion jobs	5363	20%	37.5% of new jobs
New firm jobs	8950	33%	62.5% of new jobs
Total new jobs	14313	53%	
Relocated jobs	12,536	47%	
Total jobs	26,849		



Nearly half (47%) of all jobs located on the office and industrial developments have been displaced from elsewhere in the conurbation (Table 3 and Figure 3). Over half of employment is new, nearly two thirds of which has been generated by new firms and the remaining third by the expansion of firms relocating within the urban area. By studying job creation by development it is apparent that some locations generate many *new* jobs, up to 80% of employment in some cases, whereas other developments create relatively few. Not surprisingly, developments providing starter units have a high percentage of new jobs although the nominal figures are low. Both industrial and office developments can accommodate high numbers of new jobs. Generally developments that have attracted new branches from outside the conurbation, such as Doxford Park, have generated high numbers of new jobs, whereas developments that have caused local displacement, such as Newcastle's East Quayside, have generated very few (Table 4).

Table 4 – New jobs created by development

Development	Total Jobs	Jobs relocated	New Jobs	New as a %
Armstrong	160	54	106	66%
Balliol	674	311	363	54%
Boldon	1338	317	1021	76%
Central Park	747	355	392	52%
Doxford	4417	1015	3402	77%
E. Quayside	1575	1355	220	14%
Follingsby	622	111	511	82%
Howard St	318	137	181	57%
Metro	464	428	36	8%
New York	1406	1004	402	29%
NBP	5399	3032	2367	44%
N Sands	153	43	110	72%
Royal Quays	735	472	263	36%
Silverlink	2923	1022	1901	65%
SEP	1604	950	654	41%
Sunrise	365	126	239	65%
TVTE	2640	1289	1351	51%
TEDCO	205	48	157	77%
Viking	436	207	229	53%
Walker	585	170	415	71%

Some firms will have continued to expand since the survey was completed, equally some firms may have shed staff. To counter this issue, firms were asked not just how many employees they

had at the survey date but also at the time of the original move to the new premises. The data collected indicated a strong trend of planned employment expansion, often taking place years after the original move. Interpreted in conjunction with data presented above, it appears that firms had ambitions to grow but were unable to expand their operations at their old premises. Only by moving to new premises were they able to realise their ambitions and employ more staff. This suggests that the supply and availability of modern office and industrial premises in the right place at the right time is crucial to allow for existing firms to move to facilitate expansion.

Using chaining to assess the property market filtering

Valente and Leigh (1982) suggested that the construction of new premises will generate its own filtering system. When firms move into new premises other firms will move into the premises made vacant by the initial decision to relocate. This will release other premises further down the chain that are likely to be older and will be suitable for small firms with limited resources (Valente & Leigh 1982). They adapted the concept from the residential market and applied it to a sample of 18 local authority advanced factory units 11 of which revealed chains of between two and five stages. Fothergill, Monk and Perry (1987) suggested that public sector factory building might raise an area's level of economic activity by creating vacancy chains and that public sector provision of speculative factories reinforces conditions which deter private sector development; this effect is sometimes referred to as 'crowding out'.

The chaining technique has recently been resurrected by the Centre for Urban Policy Studies (CUPS), at the University of Manchester, for their DETR (1998) commissioned research into the impact of UDC's in Leeds, Bristol and Central Manchester. Spillover effects were measured by identifying vacancy chains created by new businesses to the UDA's and following the successive links in the chains to distinguish between additionality and displacement. The CUPS survey curiously recognised chains of zero length when, in fact, only when a relocation has occurred, and a link created, can a chain exist. Of 115 potential occupier chains, 57 resulted in actual chains, of which only three comprised more than two links. This contrasts with the work of Valente and Leigh which recorded longer chains.

Having identified the occupiers of developments, their origins can be ascertained and the chains of firms, that are not new to the metropolitan area, followed to record what has happened to their old premises. Chains can end in one of four generic ways:

1. vacant
2. change of use

3. occupied
4. redeveloped

To determine chain outcomes precisely a more discriminating classification was adopted for the study of occupier chains in Tyne and Wear:

1. a vacant property available to let or for sale or awaiting redevelopment
2. a change of use from office or industrial
3. occupation by a new start-up
4. occupation by a new branch
5. occupation by expansion of an existing occupier
6. substantially redeveloped for office or industrial use

As long as premises are ultimately reoccupied by commercial uses, a relocation cannot simply be considered to represent displacement. Only where a chain ends in the vacancy or demolition of premises within the metropolitan area can one determine that intervention has generated negative displacement. The relevant event is therefore not the immediate move of a business to a property development but the net effect of the completed chain. Displacement can be associated with a move from within the local economic area which left behind a vacant or demolished building or one which was converted to non-commercial use (DETR 1998).

The end of a chain is significant because this is the ultimate manifestation of the impact of intervention and the technique permits measurement of displacement and additionality generated by policy intervention and as such allows impact assessment. Chaining thus provides a comprehensive approach to exploring the domino effect caused by in-movement and is a helpful way of identifying negative and positive spillover effects, as well as being able to distinguish between additionality and displacement (DETR 1998).

Displacement occurs when a company makes a decision to locate in assisted premises and the generation of a desirable programme output leads to the loss of the same output elsewhere. This may occur where there are resource constraints or where demand is weak so an assisted project wins market share at the expense of competitors (DoE 1993). E.Z. research has revealed that some displacement will occur when firms move onto a zone from elsewhere in the local area (e.g. boundary hopping by transfers) as well as firms moving into the local area that are diverted onto the zone rather than elsewhere in the local area (DoE 1995b).

Additionality is defined as the additional activity in those companies which would have cancelled their start-up and a proportion of the activity in those companies which would have reduced the scale, or delayed their investment, if there had not been intervention (DoE 1995a). The wider the area the more likely it is that relocations will be within the area and that other economic activity displaced will also be in the area, thus reducing additionality (DoE 1995b).

Additionality can be identified as any chain that ends with one of the following:

1. the creation of a genuinely new business (or start-up)
2. the establishment of new net activity through the creation of a new branch or through expansion, merger or reorganisation
3. relocations where the in-moving business derives from outside the local economy

(DETR 1998)

The CUPS survey did not recognise the process of absorption by a neighbouring occupier taking up the space vacated by a departing firm in order to facilitate expansion, for example by an office tenant on the floor above or an industrial tenant in the adjoining unit. The Tyne and Wear chaining survey has revealed that this process occurs with some frequency and as such it should be acknowledged as a positive side effect of generating displacements because both firms (the relocating one and their old neighbour) are improving their accommodation without creating any empty space.

DETR (1998) identified three limitations of the chaining approach. Firstly, there was a lack of comparable studies. Hopefully this research will start to address this problem and studies in other locations would contribute to our understanding of the performance of this technique. Secondly, the counterfactual problem; what would have happened without the intervention? This is an unavoidable issue when studying local property markets and one which is virtually impossible to resolve satisfactorily. Chaining exercises could be undertaken in cities that have not been subject to intervention but they would not be a good proxy because of the heterogeneity of urban property markets. Finally, there was little information collected on the replacing firms further down the chain. This limitation could be addressed by performing a more detailed chaining exercise to capture the same level of data on replacing firms as has been assembled for original firms although it would be incredibly time consuming.

The filtering concept and chaining technique provide effective devices with which to conduct grounded research into the impact of intervention on a property market. The chaining technique

offers a relatively simple but highly effective method of revealing the response of occupiers to the supply and subsidy of accommodation and tracking the knock-on effects of their behaviour in respect of the vacating and take-up of their old premises.

The chaining methodology enhances conventional approaches to policy evaluation, the majority of which have looked exclusively at policy impacts within delimited geographical boundaries (DETR 1998). The refreshing feature about chaining, compared with other methods of policy evaluation, is that the chains go where they want to go and as such the researcher cannot distort the path or the tangible outcome of a chain. By plotting the origin of firms, the geographical distribution of premises vacated by them can be mapped and the distance that they move can be calculated. In addition, the location of vacant property at the end of an occupier chain can be plotted to identify which areas have been blighted by displacement within the conurbation.

It is apparent from secondary research that the chaining technique, although well established in the residential property market, has been little used in industrial and commercial sectors and only recently adopted for the study of the impact of property-led urban regeneration. Previous studies have been confined to a very small sample (Valente & Leigh 1982) or to a single tool of regeneration (CUPS/DETR 1998). The research, covering as it does a metropolitan-wide area, across which a combination of overlapping policies have been applied, is arguably the most extensive and complex study of its type undertaken in the U.K.. By revealing the behaviour of occupiers and the strategies they adopt, in response to the promotion of property-led regeneration projects, it is a valuable contribution to our understanding of the dynamic effects such intervention can generate.

Displacement

Of the 510 occupiers captured by the telephone survey and recorded on the database, 263 (51.8% of survey firms) were either transfers or branch relocations. Thus, over half of all of all occupiers located on office and industrial developments assisted by the public sector have relocated within the conurbation. The 251 chains caused by occupier displacement resulted in a total of 376 chain ends, due to chains splitting or fragmenting. 54% of the chains end in occupation, 36% in vacant property and the remainder are change of use or redevelopment (see Table 5). This is a much higher level of displacement than recorded by the CUPS study.

It is encouraging to note that over half of all chain end properties are reoccupied, through the operation of the filtering system, by new firms or expansions of neighbouring firms. The space that

has been freed up as a result of one firm relocating can therefore create a positive opportunity for others that are looking for accommodation in an area. However, over a third of all chains result in vacant property being created elsewhere in Tyne and Wear. The distribution of this vacant property is not uniform but tends to be clustered in areas, already stigmatised and in decline, that are not robust enough to absorb vacant office and industrial space. The research has proved that property-led regeneration does cause displacement that results in a significant level of vacancy in other parts of the conurbation and confirms that the stimulation of local property markets in specific locations or zones has been at the expense of other areas. It also reveals that a filtering process does operate to take up empty space and that premises those premises left vacant at the end of the chains generally physically, economically and functionally obsolete.

Table 5 – Profile of developments by chain generation and outcome

Development Name	*Number of occupiers A*	*Number of chains B*	*As a % of A*	*Number of splits C*	*Number of chain ends D*	*Fragmentation Rate E (C/B)*	*Chains ending in occupied property F*	*Chains ending in vacant property G*	*Change of use H*	*To Do I*	*Occupied chains as a % of chains J = F/D*	*Vacant chains as a % of chains K = G/D*	*Average length of move L (km)*	*Chain length by number of links*			
														1 link	*2 links*	*3links*	*4 links*
Armstrong	14	**6**	**43**	0	6	0.0	3	2	1	0	**50.0**	**33.3**	3.1	5	0	1	0
Balliol	12	**8**	**77**	0	8	0.0	6	2	0	0	**75.0**	**25.0**	3.5	5	3	0	0
Boldon	33	**19**	**58**	6	25	0.3	10	14	1	0	**40.0**	**56.0**	6.2	17	7	1	0
Central Park	23	**12**	**52**	5	17	0.4	10	6	1	0	**58.8**	**35.3**	1.8	9	7	1	0
Doxford	18	**7**	**39**	14	21	2.0	15	5	0	0	**71.4**	**23.8**	5.3	13	7	1	0
E. Quayside	10	**8**	**80**	13	21	1.6	7	10	4	0	**33.3**	**47.6**	1.2	14	6	1	0
Follingsby	8	**3**	**38**	0	3	0.0	3	0	0	0	**100**	**0.0**	2.5	3	0	0	0
Howard St	26	**11**	**42**	3	14	0.3	8	3	2	0	**57.1**	**21.4**	2.5	12	2	0	0
Metro	9	**6**	**67**	9	15	1.5	8	6	1	0	**53.3**	**40.0**	5.2	9	3	1	2
New York	20	**20**	**50**	6	16	0.6	8	5	3	0	**50.0**	**31.3**	6.4	8	6	1	1
NBP	59	**31**	**53**	18	49	0.6	25	11	13	0	**51.0**	**22.4**	4.5	22	18	9	0
N Sands	24	**8**	**33**	4	12	0.5	8	3	0	0	**66.7**	**25.0**	6.3	10	2	0	0
Royal Quays	15	**11**	**73**	7	18	0.6	9	9	0	0	**50.0**	**50.0**	6.9	14	2	2	0
Silverlink	18	**14**	**74**	5	19	0.4	8	10	1	0	**42.1**	**52.6**	6.6	10	6	2	1
SEP	51	**28**	**53**	18	46	0.6	26	18	2	0	**56.5**	**39.1**	6.0	27	11	6	2
Sunrise	10	**4**	**40**	1	5	0.3	2	3	0	0	**40.0**	**60.0**	10.5	1	3	1	0
TVTE	65	**32**	**51**	12	44	0.4	23	9	7	3	**52.3**	**20.5**	4.8	29	12	3	0
TEDCO	64	**18**	**28**	0	18	0.0	14	4	0	0	**77.8**	**22.2**	4.7	16	2	0	0
Viking	14	**9**	**56**	4	13	0.4	4	6	2	1	**30.8**	**46.2**	4.4	8	4	1	0
Walker	12	**6**	**50**	0	6	0.0	1	4	0	1	**16.7**	**66.7**	4.9	5	1	0	0
Total or Average	508	**251**	53	125	376	0.5	198	130	38	5	**53.6**	**35.9**	4.9	237	102	31	6

It is apparent from column B of Table 5 that some developments have caused high levels of displacement elsewhere in the metropolitan area, whilst others have had relatively little impact. Developments such as Balliol, Quayside, Metro, Royal Quays and Silverlink have generated in excess of six chains for every ten occupiers, whereas developments providing starter units such as TEDCO and North Sands have generated less than four chains per ten occupiers. Doxford and Follingsby Parks have generated similarly low figures because they have been the destination of new branches originating from outside the region. The remaining developments have generated between four and six chains for every ten occupiers.

Developments themselves may not determine the outcome of the chains, although if the chains are only one link in length then the origin of firms attracted to a new development may be determined, in part, by its proximity to existing office and industrial accommodation that may be vulnerable to competition e.g. East Quayside. This is a potential conflict that regeneration agencies should be conscious of, particularly as the research has shown how parochial many businesses are when considering where to relocate.

The research does not apparently accord with the CUPS chaining exercises that recorded much lower levels of displacement and vacancy. For example, in Leeds over half the firms were new businesses or new branches, with only 13% of firms having moved to the UDA from elsewhere in Leeds. In Bristol over 75% of the chains represented additionality with only 5% of the chains resulting in premises being left vacant elsewhere in Bristol. In Manchester, of 41 new firms, only 7 were relocations that resulted in vacancy elsewhere in the metropolitan area (DETR 1998).

The discrepancy between the significant levels of vacancy recorded by the subject study and the modest levels of vacancy reported by CUPS, may in part be due in part to differences in the application of the chaining methodology. In addition, the larger survey area and inclusion of a greater number of policy tools will generate more chain starts and chain ends that may ultimately result in vacant property within the conurbation. The two sets of results may not in fact be that different because the subject research recorded that 51.6% of firms are relocations and that 36% of the chains they are responsible for generating result in vacant property. The net rate of vacancy by firm is therefore around 19% (0.516 x 0.36), which is not dissimilar to the figure that can be calculated from the above data for Leeds (7/41) or 17%.

Change of Use

The interpretation of change of use is different between the two studies, with CUPS regarding change of use as a negative outcome. In contrast, the subject research has change of use as a separate category because it may contribute positively to regeneration of an area. It should be noted however that although vacant premises are redeveloped and reoccupied, jobs that have been displaced are unlikely to be replaced and most new uses do not generate employment. The table below reveals the end uses recorded by the chaining exercise.

Table 6 – End uses where changed

Residential	*Car Parking*	*Healthcare*	*Retail*	*Leisure*	*Landscaping*	*Total*
14	4	10	4	4	2	38

More than a third of changes of use are to residential, which is viable in locations where former commercial and industrial uses are not and contributes to the Government's target for 60% of new housing to be built on brownfield land. The redevelopment of under-utilised buildings for residential use will be further encouraged by the introduction of fiscal incentives announced in the 2001 Budget. These include tax relief to property owners for the cost of converting redundant space over shops into flats for letting, reductions in VAT for the cost of converting residential properties into a different number of dwellings and stamp duty exemptions for transactions under £150,000 in deprived areas (HM Treasury 2001). This package of incentives, targeted predominantly at deprived areas, will make redevelopment for residential use more viable and attractive to private sector investors and as such could provide a solution for some of the vacant properties at the end of chains.

Suitability for change of use is strongly influenced by the location and type of property, with large older buildings in residential areas lending themselves not just to conversion to apartments, but also to surgeries, care homes and nurseries. Occupiers relocating to office developments, such as Newcastle Business Park, have generated far higher numbers of changes of use because unlike industrial occupiers, the premises that they vacate are suitable for conversion to such uses. Industrial property is generally less well suited to a change of use, with warehouses and large industrial sheds perhaps being the two types of industrial property most suitable to adaption to residential use or leisure use respectively.

The number of chains

The survey recorded 251 chains, generating 125 splits, to total 376 chain ends (see table 5). Column C records the number of splits in the chains and column E calculates a fragmentation rate, which is the number of splits divided by the original number of chains. Splits occur when a chain fragments because the occupier originates from more than one property, usually as a result of corporate rationalisation. Fragmentation may also occur when larger premises are split in to nursery or starter units, usually though the intervention of a local authority or regeneration agency.

Developments with a fragmentation rate greater than one have initiated more chains, as a result of splitting, than were generated by the original development. Doxford Park, Quayside and Metro are notable in this respect, indicating that they have attracted occupiers that have consolidated their operations, bringing a number of previously separate branches under one roof (e.g. legal firms moving to Newcastle quayside).

Table 7 – Chain links and transactions

Chain length by number of links	*Number of occupiers*	*Number of chain links*	*Number of property transactions*
0	257	N/A	257
1	243	243	486
2	97	194	291
3	30	90	120
4	6	24	30
Total number of chains and links	633	551	1184

It is possible to calculate the total number of property transactions created by intervention in the property market (see table 6). The figure is the sum of the number of occupiers on the 20 developments that did not generate chains plus all chain links and totals nearly 1200 transactions. The number of transactions generated can be thought of as a measure of the level of excitation in the property market. This is generally perceived to be a positive outcome because is suggests that a local property market is being stimulated and occupiers are responding to the supply of new accommodation and moving up the property ladder, creating a filtering effect.

CUPS suggested that the spatial extent of property excitation in Manchester, Leeds and Bristol was very limited and that the market area affected by UDC activities had a very limited reach (DETR 1998). This conclusion is not supported by the Tyne and Wear study which recorded more

than two transactions for every original unit of property created, indicating a significant level of excitation and revealing a strong filtering effect to be in operation across the conurbations. As noted earlier, starter or nursery units have a high turn over of tenants and as such the level of excitation recorded should be viewed as a minimum.

The length of chains

The CUPS study found that chains were generally short in length, with only eleven chains of two or more links, indicating the limited extent of the domino effect (DETR 1998). Most chains in the subject study are only one link in length (63%) with vacated accommodation typically being reoccupied by new firms, branches or adjoining occupiers. However the average length of chains is greater, at approximately 1.5 links, and 37 chains were recorded of three or more links. This accords more closely with the research by Valente and Leigh (1982) who observed chains of up to five stages and an average chain length of over two links.

An important factor affecting not just the distance of moves, but also the number of relocations recorded, is the size of the study area. The larger the area studied the greater the number of chains and the longer they are. The Tyne and Wear conurbation covers a greater area than Leeds or Bristol, however the Manchester metropolitan area is of a similar size and produced a slightly higher average chain length than the other two studies. The difference may also be due to the persistence with which chains are followed to their natural end point.

There is evidence that the higher a new building is up the property ladder, in terms of its size and specification, the longer the chain that is generated. If public sector agencies are interested in generating greater levels of excitation in a local property market then more resources should be allocated to the supply of larger properties at the top end of the market. However, such activity does generate the side effect of higher levels of displacement and is not be compatible with the strategies and priorities of many development agencies to encourage the creation and survival of small and medium sized enterprises (SME's). As shown in table 5, the bigger office and industrial developments also create a greater number of new jobs, despite causing greater employment displacement.

Distance of moves

The average distance of moves made by firms relocating to assisted developments within Tyne and Wear was 4.9km (3 miles), with the greatest distance moved being 19.25km (12 miles). All developments attracted occupiers from within an average of 7km (4.3 miles) except for Sunrise

which generated an high average distance of 10.5km (6.5 miles) due to a small number of long moves.

Valente and Leigh's (1982) filtering chains were geographically localised, with relocation distances declining from 1.8 miles for firms moving into newly built premises to 0.4 miles for premises at the bottom of the filtering sequence. The average move distance recorded in Tyne and Wear is greater because all the premises are new and therefore higher up the property ladder than the small mixed sample studied by Valente and Leigh.

Developments providing starter or nursery units, such as Howard Street, N. Sands and TEDCO, do not have noticeably lower average distance of moves and there does not appear to be any correlation between the size of a firm and the distance it is prepared to move. Of greater significance is the proximity of a development to the source or supply of potential occupiers. Office developments at Central Park and East Quayside, both located on the periphery of Newcastle's CBD, have encouraged occupiers from Newcastle City centre to make relatively short moves, of less than 2km (1.2 miles). More remote developments, such as Boldon, Doxford and New York, have not surprisingly attracted relocations from a greater distance away.

The people making the decision of where to relocate a business do not tend to look very far afield, usually choosing the nearest satisfactory alternative. This is partly due to familiarity with a particular area and to being limited geographically by the workforce, but is also due to parochialism and a strong loyalty to their part of the town or city. Firms were also often unaware of potential locations further afield and the rationale for choosing a particular location over another was often weak and based on poor information.

Spatial distribution of relocations

In the Manchester study, CUPS discovered that a relatively large proportion of moves created vacancies in the City centre and provided some evidence to support the 'hollowing out' thesis, not least since most were associated with office relocation from the traditional core of the city. There was thus evidence of some displacement, suggesting that intervention in city centre land and property markets had served to fracture the geographical integrity of the city's office market by draining development into the UDA (DETR 1998).

Concentrated hollowing out has been observed in a number of locations in Tyne and Wear, notably Grainger Town in Newcastle, the eastern fringe of Sunderland City centre and Washington New

Town. The research has recorded that sixty office occupiers left Newcastle City centre, two thirds of whom relocated to the nearby office developments of Newcastle Business Park, East Quayside and Central Park. Sunderland City centre lost 21 occupiers, almost all of whom have relocated to office developments at Sunderland Enterprise Park, Doxford Park and North Sands. Washington New Town, where 28 predominantly industrial occupiers relocated to Boldon, Sunrise and Sunderland Enterprise Parks, has probably been hit hardest of all (see below). This outcome was predicted in a 1992 study, carried out for English Partnerships, that concluded that Washington could not compete with the advantages offered by the Sunderland E.Z.'s (Sanderson Townend and Gilbert 1992)

It is apparent that developments have varying spheres of influence, with high quality office schemes attracting relocations from across the conurbation while others generate only local displacement. North Shields, Wallsend and South Shields have lost occupiers to nearby small business or cluster schemes at Howard Street, Royal Quays and TEDCO respectively. In contrast, Team Valley is such a large development, providing a full range of industrial and office accommodation, that firms can relocate within the estate. Some developments, such as Newcastle Business and Sunderland Enterprise Parks, have lost occupiers to other newer developments and it appears that some occupiers follow the incentives. Agencies need to be attuned to this behaviour to prevent firms from relocating simply in order to secure new accommodation at a subsidised rate.

The spatial distribution of vacant property

The chaining technique has allowed the location of chain end properties, both occupied and vacant, to be plotted. Those locations with a concentration of *occupied* properties indicate not just a source of occupiers of office and industrial property but a robust local market that can absorb vacant space through the filtering effect. Those areas with concentrations of *vacant* property are also a source of occupiers for new developments or other property in the chains, but do not have sufficient local demand to take up the vacant space.

Locations such as Grainger Town, Jesmond and Sandyford, The Regent Centre and Team Valley, have all lost occupiers, to new developments and other property in the chains, but have relatively low levels of vacancy (less than one in every three chain properties remains vacant). These locations appear to have some resilience and are still sought after by other occupiers who will take up the better vacant space. Other locations such as the east side of Sunderland City Centre, East Gateshead, Jarrow and Washington, have not only lost occupiers but have not been as successful

in achieving reoccupation of vacated property. In these locations the vacancy rate among chain properties can exceed 50%.

It is interesting to draw comparisons between Newcastle and Sunderland City centres. Office activities had been moving out of Grainger Town for years, in order to meet modern requirements and the area was unable to compete for or satisfy large space requirements. The Grainger Town Project has spent the last five years promoting a renaissance of Newcastle's historic core which has resulted in considerable redevelopment of vacant and underused buildings (see Investing in Heritage: The Renaissance of Newcastle's Grainger Town, 2001). The value of refurbished offices is now often below that of other uses, particularly residential, and viable office space in Grainger Town will increasingly be provided as part of mixed use development (Grainger Town 2001).

By contrast, the east side of Sunderland has been crying out for attention for years but only recently has the initiative been taken to promote the area's rehabilitation. Sunderland ARC (Area Regeneration Compact), set up by ONE NorthEast, has just announced the creation of an urban regeneration company which should start to address some of the needs of the east end of Sunderland.

Another interesting comparison is the success of the Team Valley Trading Estate, promoted over the last 40 years by English (Industrial) Estates, English Partnerships and now ONE NorthEast, and the decline of Washington New Town. Team Valley is unrivalled as the premier industrial location in the north east of England and is one of the few locations in the region where speculative private sector-led industrial development is now profitable. Washington in contrast is continuing to struggle and desperately requires some special attention to overhaul its now obsolescent industrial stock.

Conclusions

The study of over 500 firms and the investigation of 376 chain ends resulting from 251 occupier chains, across a single conurbation, is one of the most comprehensive exercises of this type attempted in the U.K.. It reveals that intervention in the property market, by subsidising property development and occupation, does cause displacement with over half (52%) of all occupiers of assisted property developments having relocated within Tyne and Wear. Encouragingly, over half (54%) of chain end property has been re-occupied whilst around one third (36%) is vacant. The extent of the influence of property developments can be conurbation wide, indeed it can extend well beyond the boundaries of the urban area.

Over half of the jobs located on the developments are net new; two thirds of which created by new firms and one third by local firms expanding when they relocate. The remaining 47% of jobs have been displaced from elsewhere in the conurbation. Most firms relocate in order to expand and most intend to remain in their new premises for at least ten years.

One chain is generated for every two occupiers and most are short and simple, only one link in length. Some are longer, up to four links in length; others fragment into five or more separate chains, whilst some connect. The chains go where they want to go; the role of the researcher is to follow them as thoroughly as possible. The chaining method is an effective way of examining the filtering effect that operates to a greater or lesser extent in all property markets, revealing the spillover or side effects caused by property development activity. As such its application is wider than just the field of property-led regeneration.

The average distance of relocations to new developments is short and this has implications for areas that are in close proximity to a new development as they may be a source of potential occupiers. Hollowing out has been observed in Grainger Town, Sunderland City Centre and Washington in particular. Vacated property is often taken up by neighbouring occupiers and when change of use occurs it is predominantly to residential use. Whilst potentially vacant buildings are being brought back in to use there is a concern that jobs that have been displaced are not being replaced.

The research confirms that property-led intervention is effective at stimulating local property markets, causing excitation and allowing firms to expand. However, not all the outcomes of this intervention are desirable and responses are required to deal with the side effects of policies where they impact negatively on other areas. Public agencies should contemplate adopting policies to discourage relocations that generate little genuine additionality or that cause displacement and vacancy in areas with weak markets or structural problems. Strategies may need to be adopted by public sector agencies, promoting property-led regeneration, to mitigate the negative effects of displacement on vulnerable locations.

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Acronyms and Abbreviations

DETR	Department of the Environment, Transport and the Regions
DoE	Department of the Environment
EGRUP	Evaluation Group on Regional and Urban Programmes
EP	English Partnerships
ERDF	European Regional Development Fund
EZ	Enterprise Zone
RDA	Regional Development Agency
RDC	Rural Development Commission
RICS	Royal Institution of Chartered Surveyors
SRB	Single Regeneration Budget
TWDC	Tyne and Wear Development Corporation
UDA	Urban Development Area
UDC	Urban Development Corporation

Table 8: Profile of Developments

No.	Development	Profile	LA	CC	CG	DLG	EP	Euro	EZ	UDC	Site Condition
1	Armstrong Industrial Estate	Industrial	NC			✓			✓		DI
2	Balliol Business Park	Office/ Industrial	NT				✓		✓		GR
3	Boldon Business Park	Office/ Industrial	ST				✓				DC
4	Central Business & Technology Park	Office/ Incubator	NC							✓	DR
5	Doxford International Park	Office	S					✓	✓		GR
6	East Quayside	Mixed use	NC							✓	DD
7	Follingsby Park	Industrial	G					✓			DR
8	Howard Street	Office/ Incubator	NT	✓	✓	✓					DCom
9	Metro Riverside Park	Office/ Industrial	G						✓		DI
10	New York Industrial Estate	Industrial	NT				✓		✓		GR
11	Newcastle Business Park	Office	NC						✓	✓	DI
12	North Sands Business Centre	Incubator	S				✓	✓		✓	DI
13	Royal Quays	Mixed Use	NT					✓	✓	✓	DD
14	Silverlink Business Park	Office/ Industrial	NT	✓	✓				✓		GR
15	Sunderland Enterprise Park	Office/ Industrial	S				✓		✓	✓	DC
16	Sunrise Enterprise Park	Industrial	S						✓	✓	GR
17	Team Valley Trading Estate	Mixed Use	G				✓		✓		GR
18	TEDCO Business Centre	Incubator	ST					✓		✓	DI
19	Viking Industrial Park	Industrial	ST				✓		✓	✓	DI
20	Walker Riverside	Industrial	NC				✓			✓	DD

Key:

Local Authority Code

G	Gateshead
NC	Newcastle
NT	North Tyneside
ST	South Tyneside
S	Sunderland

Condition Code

DD	derelict docks
DC	derelict colliery
DCom	derelict commercial
DI	derelict industrial
DR	derelict railway
GR	greenfield

Public Sector Assistance

CC	City Challenge
CG	City Grant
DLG	Derelict Land Grant
EP	English Partnerships
Euro	European Union
EZ	Enterprise Zone
UDC	Urban Development Corp

Table 9: Profile of Developments

Development Name	Location/address	Developer Name	Number of units	Floorspace (sqm;sq ft)	Date Opened	Site Area (ha;a)	Public Funding (£m)	Total Investment (£m)	Intervention	Description
Armstrong Industrial Estate	Water Street, Elswick, Newcastle upon Tyne	Dysart & Newcastle City	46	8732; 94,000	1987	3.2; 7.9	£2m + EZ	£36m	EZ + DLG	previously Vickers Armstrong
Balliol Business Park	Benton Lane, North Tyneside	English Partnerships/ONE	15	32516; 350,000	1995	34; 84	EP + EZ	unknown	EP & EZ	greenfield; part EZ
Boldon Business Park	Boldon, South Tyneside	English Partnerships/ONE	40	15329; 165,000	1994	42.5; 105	EP	unknown	EP	former colliery
Central Business and Technology Park	Manors, Newcastle upon Tyne	Budge & TWDC	5(43)	12913; 139,000	1992	2.3; 5.7	£2.4m	£14m	UDC	former railway station
Doxford International	City Way, Sunderland	Akeler	11	4181; 450,000	1993	19.5; 48	EZ + Europe	unknown	EZ & Euro	greenfield site; part EZ
East Quayside	The Quayside, Newcastle upon Tyne	AMEC & TWDC	5	19881; 214,000	1995	10; 25	£69m	£170m	UDC	derelict warehousing
Follingsby Park	Follingsby Lane, Wardley, Gateshead	White Rose & British Rail	14	46000; 495,000	1995	32; 80	£7.6m	£19m	Euro	Former railway sidings
Howard Street	Howard Street, North Shields, North Tyneside	North Tyneside MBC	36	3717; 40,000	1995	N/a	£8.6m	£15.8m	CC; CG; DLG	derelict buildings
Metro Riverside Park	Western Riverside, Dunston, Gateshead	J.F. Miller Properties	10	12728; 137,000	1997	4.9; 12	EZ	Unknown	EZ	North of Metro Centre; fly ash tip
New York Industrial Estate	Middle Engine Lane, North Shields, North Tyneside	English Partnerships/ONE	19	46451; 500,000	1995	12; 30	EP + EZ	Unknown	EP & EZ	greenfield; part EZ
Newcastle Business Park	Scotswood Road, Newcastle upon Tyne	Dysart Developments & TWDC	25	63452; 683,000	1991	28; 69	£12.5m +EZ	£140m	EZ & UDC	Previously Vickers Armstrong
North Sands Business Centre	Dame Dorothy St, Sunderland	TWDC & English Partnerships	1(47)	2842; 30600	1992	N/a	EP	£2.8m	EP; UDC; Euro	serviced offices
Royal Quays	Howdon Road, North Shields, N. Tyneside	TWDC	3	18580; 200,000	1994	81; 200	£45m+ EZ	£245m	EZ & UDC	former docks; inc. residential & leisure
Silverlink and Cobalt Business Parks	The Silverlink, North Shields, North Tyneside	Silverlink Properties; Highbridge Properties	22	83612; 900,000	1991	40; 99	EZ	£1.1bn	EZ; CC; CG	part EZ; reclaimed to greenfld
Sunderland Enterprise Park	Colima Avenue, Hylton Riverside, Sunderland	EP; TWDC; Easter; Management; Terrace Hill	50	29914; 322,000	1993	53; 130	£5.5m + EZ	£100m	EZ & UDC	former colliery
Sunrise Enterprise Park	Ferryboat Lane, Sunderland	Scottish Provident & TWDC	9	21089; 227,000	1993	6; 15	EZ	£7m	EZ & UDC	greenfield; EZ
Team Valley Trading Estate	Team Valley, Gateshead	English Estates/English Partnerships/ ONE	250	192900; 2075000	1980	76; 188	£140m	£246m	EP & EZ	greenfield; part EZ
TEDCO Business Centre	Viking Industrial Park, Jarrow, South Tyneside	Tyneside Economic Development Company	3(120)	4645; 50,000	1995	2; 5	Unknown	Unknown	Euro & UDC	incubator units; derelict land
Viking Industrial Park	Rolling Mill Rd, Jarrow, South Tyneside	TWDC	10	27871; 300,000	1994	12; 30	£10m + EZ	£20m	EZ; UDC; EP	derelict industrial
Walker Riverside	Wincolmlee Rd, Walker, Newcastle upon Tyne	Newcastle City; TWDC; English Partnerships/ONE	8	24155; 260,000	1992	24; 60	£6m	£44m	UDC & EP	former derelict docks
TOTALS			567	502722; 5481,0000		482; 1194	£308.6m + EZ	£2340m		